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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/811,509	03/20/2001	John Shannon	9958-002-27 CONT	1381

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Supervisor, Patent Prosecution Services
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Washington, DC 20036-2412

EXAMINER

CHEN, SHIN LIN

ART UNIT	PAPER NUMBER
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1632

DATE MAILED: 12/02/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/811,509

Applicant(s)
Shannon et al.

Examiner
Shin-Lin Chen

Art Unit
1632



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-32 is/are pending in the application.
- 4a) Of the above, claim(s) 24, 25, 27, 30, and 32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23, 26, 28, 29, and 31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 2
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Art Unit: 1633

DETAILED ACTION

This application is a continuation of Application No. 09/167,481 filed 10-8-98, which was abandoned on 3-21-01.

Applicants' preliminary amendment filed 7-19-01 has been entered. Claims 1-22 have been canceled. Claims 23-32 have been added.

1. Applicant's election with traverse of group I, claims 23, 26, 28, 29 and 31, in Paper No. 4 is acknowledged. The traversal is on the ground(s) that the distinction between groups I and II or groups III-IV is not so significant and there are overlapped classification, such that there is no extra search burden for examiner. This is not found persuasive because they are drawn to materially different methods that use different materials: sponge plus bacteria, sponge plus transgenic bacteria, transgenic sponge plus bacteria, and *Cenarchaeum symbiosum*. A transgenic bacteria or a transgenic sponge can harbor various different transgene that has different chemical structure and biological function. Therefore, a bacteria is different from a transgenic bacteria and a sponge is different from a transgenic sponge in their chemical structures and biological properties. They are methods that differ at least in materials used, doses and schedule used, and response variables. They have different classifications or subclassifications and require separate search. Thus, they are patentably distinct from each other.

The requirement is still deemed proper and is therefore made FINAL.

Art Unit: 1633

2. Claims 24, 25, 27, 30 and 32 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 4.

Claims 23-32 are pending and claims 23, 26, 28, 29 and 31 are under consideration.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 23, 26, 28, 29 and 31 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 23, 26, 28, 29 and 31 are directed to a method of recovering metals and minerals from sea water by contacting a sponge harboring a bacteria capable of concentrating said metals or mineral with said sea water and recovering the concentrated metal or mineral from the bacteria. Claim 26 specifies the bacteria is selected from the group recited in the claim. Claims 28 and 29 specify the bacteria are Pedomicrobium and cyanobacteria, respectively.

The claims encompass using a sponge harboring any bacteria capable of concentrating metals and minerals, wherein said bacteria could cultivate on the sponge and accumulate metals

Art Unit: 1633

and minerals. The specification of the present application only provides a proposal of farming 2,000,000 sponges to collect over 3.8 million troy ounces of gold. The prior art of the present application indicates several different species of bacteria can accumulate gold, silver, and other minerals from seawater, and a psychrophilic crenarchaeon inhabits a marine sponge and a mercuric ion reductase gene, MerA, which converts toxic Hg^{2+} to the less toxic relatively inert metallic mercury (Hg^0), was modified and used to generate transgenic *Arabidopsis thaliana* which is resistant to toxic Hg^{2+} .

The specification of the present application fails to provide adequate guidance and evidences for how a bacteria capable of concentrating metals or minerals could be delivered to the flora of sponges and populate sponges such that said bacteria could grow to reach appreciable numbers so as to be able to concentrate metals and minerals. The specification of the present application fails to provide adequate guidance and evidences for whether any of the symbiotic bacteria of a sponge could concentrate any metal or any mineral. Preston et al., 1996 (specification, page 5) only discloses a psychrophilic crenarchaeon inhabits a marine sponge, there is no evidence of record that said psychrophilic crenarchaeon could accumulate metals or minerals. The specification fails to provide adequate guidance and evidence whether the bacteria, known in the art and disclosed in the specification, that is capable of concentrating metals or minerals and any symbiotic bacteria of a sponge could cultivate on a sponge and obtain an appreciable numbers so as to concentrate metals or minerals on the sponge from the seawater. Thus, one skilled in the art at the time of the invention would not know how to use the claimed

Art Unit: 1633

sponge harboring any bacteria for concentrating and recovering minerals or metals from sea water.

In view of the lack of guidance for cultivating bacteria capable of accumulating metals or minerals on a sponge such that sufficient numbers of bacteria are obtained so as to concentrate the metals and minerals and the lack of evidence that any symbiotic bacteria of a sponge could concentrate metals or minerals, it would have required a skilled artisan at the time of the invention undue experimentation to practice over the full scope of the invention claimed.

The quantity of experimentation to practice the claimed invention would include: isolation and characterization of various symbiotic bacteria of a sponge having the ability to concentrate metals and minerals, trial and error experimentation to grow the bacteria capable of concentrating metals and minerals or said symbiotic bacteria on the sponge, and trial and error experimentation to determine whether said bacteria could cultivate on a sponge to obtain sufficient numbers so as to concentrate and recover metals or minerals on the sponge.

Conclusion

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shin-Lin Chen whose telephone number is (703) 305-1678. The examiner can normally be reached on Monday to Friday from 9 am to 5:30 pm.

Art Unit: 1633

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Reynolds can be reached on (703) 305-4051. The fax phone number for this group is (703) 308-4242.

Questions of formal matters can be directed to the patent analyst, Patsy Zimmerman, whose telephone number is (703) 305-2758.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist, whose telephone number is (703) 308-0196.

Shin-Lin Chen, Ph.D.

A handwritten signature in cursive script, appearing to read 'sichen', located below the printed name.